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PROFILING ONLINE SELF-REPRESENTATION FOR CYBER FORENSICS: ANONYMITY AND AGEISM IN CYBERSPACE

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ABSTRACT

Cyberspace offers ample opportunity where gender and age can lose their meaning with the influence of ageism. Online self-representation usually begins with a created gendered avatar followed by age identity. Empirical social data comprising surveys, random comments, and texts of 127 respondents were analyzed both quantitatively and qualitatively. The analysis showed that anonymity was assumed differently with eight possible reasons as gender was transferred online. Ageism experience was also identified differently by both male and female. A profile on online self-representation for cyber forensics was subsequently established based on gender and age identity in addition to avatars. The findings have some forensic use as avatars layered with anonymity and ageism which facilitate some degree of self-disclosure due to similarity in belief, values, and attitudes to the users.

Keywords: *cyberspace, anonymity, ageism, online self-representation, cyber forensics*

INTRODUCTION

The cyberspace affords ample opportunities to represent or misrepresent age perceptions. This raises interesting and intriguing questions as to how ageism in the cyberspace is shaped. Stereotyping that is prevalent in the offline world inadvertently helped shaped the online self-representation with ageism. This study was conceived as a contribution to cyber forensics. Cyber forensics can be defined as the process of extracting information and data from cyberspace and guaranteeing its accuracy and reliability. Forensic investigators typically follow a standard set of procedures: Any evidence found in cyberspace is isolated to make sure it cannot be accidentally contaminated. Evidence from the case is analyzed and then used to construct a behavioral profile specific to the current case only. Regardless of the method utilized, profiling rarely identifies the specific offenders. Instead, it reduces the number of potential suspects and allows the usually limited amount of investigative resources to be used more effectively and efficiently. This article presents the results of a quantitative and qualitative analysis of online self-representation of age identity negotiations and presentations.

Avatar creation provides cues to an individual's preference and personality. A previous study by Cheong and Hanis (2013) has shown support to the gendering of avatar for online self-representation was based on social norms and expectations. It was observed in their study that the 76 participants were inclined to draw an avatar that corresponded to their physical age, which was 21-22 years. Females tended to represent themselves in greater detail as compared to males. Further, females created avatars according to their offline gender identity and social contexts.

The avatars for males leaned towards their outdoor activities such as driving (car, wheel), climbing trees, debugging programs (bug) and playing ball. The avatars for male and female respectively were very much linked to the cultural process and marketing of products as observed in the physical environment. Such expressions show that gender is consciously constructed. Most importantly, the study showed that gendering of avatars does permeate cyberspace.

This study investigated how the various age groups of each gender responded to anonymity and ageism experience while being online. A

cyber forensics framework for profiling online self-representation was subsequently proposed based on gender and age identity in addition to avatars from an earlier study. The assumption of this study was that age identity negotiations and presentations occur in the context of stereotypes of ages.

BACKGROUND

Stereotypes

Stereotypes are knowledge structures that provide information about the typical characteristics of certain social groups. Stereotypes allow perceivers to draw inferences about others based on their group membership. They can be regarded as inferential tools that tend to facilitate inference generation about people we observe, without the perceivers needing to know which specific information about them beyond the social groups to which they belong (Ramos, Garcia-Marques, Hamilton, Ferreira & Van Acker, 2012). It therefore follows that attitude towards certain age groups may influence and alter interactions, either online or offline (Lassonde, Surla, Buchanan & O'Brien, 2012). Lassonde et al. (2012) highlight the difference between stereotypically consistent and inconsistent behaviors. They further contend that age-related information is available in the general world knowledge. Literature on ageism tends to focus on biases towards older adults (e.g., Cherry & Palmore, 2008; Lumme-Sandt, 2011). A study conducted by Lin, Hummert, and Harwood (2004) has shown that framing tactics were used in the age identity in the online discussion forum. Analysis of older adults revealed that stereotypes were drawn in building their age identities.

Age Identities

Ageism is a type of discrimination against individuals based on their age. Ageism makes judgments about the actions, character and desires of people based on their age. It is a system of stereotypes, policies, norms, and behaviors that discriminate against, restrict, and dehumanize people because of age. In Kaufman and Elder (2002), personal age identity changes as people feel differently about themselves as they age. Their perceptions

of their age do not tend to keep pace with their actual age. This creates a corresponding challenge to the self-concepts of older individuals. People learn different things, face different things and respond differently to life's occurrences. Interestingly, they adopt social creativity strategies to reconstruct the meaning of age at a psychological level to achieve positive and social identity (Harwood, 2007). Findings of Blaine (2013) emphasized that categorization of people into age groups supports ageism.

Age categorization processes are involved in disclosing age by explicitly indicating age-related characteristics in talk (Lin, Hummert, & Harwood, 2004). These processes disclosed chronological age, age-related category or role references, and age related experiences. Besides, there is temporal framing that refers to discursive strategies involving events and persons: Adding time-past perspective to current or recent events and topics: association of self with the past; and recognizing historical and cultural change. As such, it invokes the speaker's age. Some may differentiate themselves by achieving a positive group identity by verbally distancing themselves from other groups. Meisner (2012) conducted a meta-analysis of studies that manipulated age identities. It was found that negative age stereotyping has a much stronger influence on important behavioral outcomes among older adults than positive age stereotyping (Ramos et al., 2012; Lin, Hummert & Harwood, 2004; Blaine, 2013).

The cyberspace provides self-exposure social networking with ever growing and broadening tool-sets: Facebook, LinkedIn, Flickr and Twitter. These are embedded with the nurturing of the intimate and internal features – attending to one's thoughts and feelings including the presentation of self to others. The most important consequences of these rich experiences are the multiple and contextual emphasis on identity, and self-detachment from the rigid social structures and status (Yoo, Peña & Drumwright, 2015). However, being authentic in both online and non-mediated environments may pose a dilemma, such as deciding to incur the negative social judgment of their audience for expressing their authentic selves or to endure the negative reprimand for failing to be authentic. Conversely, choosing to express inauthentic opinions and ideas in order elicit positive evaluations from the audience (Lim, Nicholson, Yang & Kim, 2015).

Building on the idea that the online self-representation is a choice, and it can be a dramatic representation of self. Each representation is able to self-expose in a variety of roles, images and activities. Consequently, the multiple identities must follow the pattern of identity in the physical world which is a rich data mine for cyber forensics.

DATA COLLECTION

Exploring concepts and features from social data affords a rich insight into a social context. Data were drawn from 127 respondents comprising 46 males and 81 females. 60% were in the age group of 25-49 years, 31% in the age group of 20-24 years, 6% in the age group of 13-19 years, and 3% in the 50-59 years group. A self-administered questionnaire, combination of tick box questions consisting of eight items of anonymity and twelve items on ageism, as well as random comment from blogs, was used. The questionnaire did not include a detailed breakdown of respondents' personal detail. This was done to maximize the response rates.

FINDINGS

Table 1 shows the distribution of gender with the eight items of anonymity while being online. Interestingly, 64% of females said that they would like to be someone else, achieve unbiased evaluation, and express forbidden opinions in cyberspace; this is in contrast to only 36% of males.

“Being someone else” enabled the respondents to seek acknowledgment, acceptance and understanding. To get these, they learn or copy from others and present themselves to be seen as part of the accepted society. A large percentage (52%) responding to this were from the age group of 25-49 years. One reason behind the figure was that they were intrigued by the behavior and presented themselves with the same behavior to elicit reactions to the said behavior. Being a conformist and keeping up with the trend was more acceptable and easily referenced as compared to “rebellious”, “unique” and “special”.

Another reason for being someone else was to appear closer to others and show that they would like to be friends. Being in a like-minded circle helped a person to copy the behavior in thinking, feeling, speaking, and injecting the specific qualities into oneself. There is a difference between our internal experience of our identity and the way we experience our public persona. The internal experience is more immediate, less mediated and intentional, and so we tend to think of it as the real us. Our public persona seems more artificial in contrast, especially if we are trying to intentionally control it in some way. The process of identity, community formation and social interaction forms the sociability of self, as aptly put by a respondent, “I wanted to be someone else that I assumed I’m a small part of that person. This required a lot of energy and consciousness which was exhausting. I thought that somehow by adapting mannerisms, I was adjusting myself into another person. I was unaware of why I was doing what I was doing.”

Table 1: Frequencies of Gender in Anonymity

Anonymity	Male	Female	Total
Being someone else	41 36%	72 64%	113 100%
Hiding certain information	24 44%	31 56%	55 100%
Hiding embarrassment	45 38%	72 62%	117 100%
Seeking contacts	38 37%	66 63%	104 100%
Having different authority or expertise	38 35%	72 65%	110 100%
Achieving unbiased evaluation	46 36%	81 64%	127 100%
Expressing forbidden opinions	37 36%	65 64%	102 100%
Experimenting with role-playing	37 35%	70 65%	107 100%

Being anonymous online affords respondents to be “more equal in discussions”. They felt that they could achieve unbiased evaluation as “factors like social economic status, gender, belief affiliation, will not influence the evaluation of what they say”. Additionally, they can project themselves as having different authority or expertise.

Expressing opinions or thoughts that were “indecent”, “improper”, or “inappropriate” is a “shield for one’s belief” to avoid retribution due to lack of understanding from others. The respondents felt the need to express their opinions anonymously when dealing with societal problems or intolerant conditions whereas in the real life they have to watch what they said.

A large percentage of the respondents that experimented with role playing were females. Posing as respectable profile can be a tool for “timid people” to establish contacts and network for business. A man posing as a woman wanted to understand the feelings of people of different gender. “I have misled other people that I am a certain profile” seemed to be a popular pastime among the respondents.

From the forensic perspective, we can categorize sets of people based on perceived patterns, a notion of in-group social coherence to relate and share with one another. We would be able to find a lot of similarities between individuals. Individuals undoubtedly would be directly associated with other individuals. Identifying perceived patterns enable us to distinguish between predator and prey, friend or foe, or any uncanny relationships. Patterns that fit a common set of perceptions most often will lead to a given result. We learn these associations from experience.

Table 2 shows the distribution of ageism experience rank ordered by the positive responses of the respondents. The most frequent ageism experience were assumptions made about a person’s interest based on age, being referred as a part of an age group instead of an individual, and felt being targeted for suspicious products or services due to age.

Identifying ageism can be difficult. More than 10% of the respondents were not sure that they have experienced ageism when it affects them personally except for item 7. A respondent stated that she had to lie about her age to avoid an unpleasant situation: “I rode a public utility vehicle. The

driver flirted with me asking for my age. To discourage him and make him stop flirting with me, I told him I'm in secondary school. He stopped talking to me." Another respondent covered up her age to be given an opportunity: "I represent myself as a professional trainer since I already know how to do a presentation after watching them several times. I put some make up on, a corporate dress and talk like as if I've been doing that for years."

**Table 2: Frequency (%) of ageism experience.
Items rank ordered by positive response.**

No.	Ageism experience	Yes	No	Neutral
1	Has anyone ever made assumptions about your interests because of your age?	55	32	13
2	Has anyone ever referred to you as part of an age group instead of as an individual?	51	30	19
3	Have you ever felt that you were targeted for suspicious products or services because of your age?	46	41	13
4	Have you ever felt passed over for anything simply because of your age?	36	50	14
5	Has anyone ever said you would be treated differently if you weren't your current age	34	52	14
6	Has anyone ever made assumptions about your mobility because of your age?	32	53	15
7	Have you ever felt the need to lie about your age to be considered for an opportunity?	30	64	6
8	Has anyone ever expressed concern about your health simply due to your age?	28	60	12
9	Have you ever felt like the punch line of a joke because of your age?	26	61	13
10	Have you ever felt as though you were not served fairly in an e-shop due to your age?	22	63	15
11	Have you ever felt that you were not treated fairly in a healthcare setting due to your age?	20	65	15
12	Have you ever felt hurt or humiliated because of comments about your age?	12	74	14

There is a significant difference of gender perception towards Item 3, Item 5, and Item 9. Analysis of gender differences in the respective items are $F(1, 125) = 4.138, p = 0.044$; $F(1, 125) = 4.987, p = 0.027$; $F(1, 125) = 5.872, p = 0.017$.

Similarly, there is a significant difference in age perception towards Item 6 as qualified by $F(3, 123) = 3.818, p = .012$. Interestingly, a higher percentage of male respondents have ageism experience as compared to female respondents except Item 11.

In a previous study by Cheong and Hanis (2013), it was found that individuals would weigh up differently nine social representations comprising Humanoid (anthropomorphic), Male Figure, Female Figure, Inanimate Object, Animal, Insect, Cartoon, Plant, and Hybrid Form (see Table 3). An individual would negotiate which ones to use as their self-definitions.

Table 3: Category Description

Category	Description
Humanoid	A being having an appearance or character resembling that of a human
Male Figure	Characteristic of a man
Female Figure	Characteristic of a woman
Inanimate Object	Non-living things
Animal	Multicellular organism which has the capacity for locomotion
Insect	A small arthropod animal that has six legs and generally one or two pairs of wings
Cartoon	A simple drawing showing the features of its subject in an exaggerated way
Plant	A living organism of the kind exemplified by trees, shrubs, herbs, grasses, ferns, and mosses
Hybrid Form	Something of mixed origin or composition that adds variety or complexity

In this study, it was found that an individual can define himself differently in different messages as well. Some of these definitions seem to include contradictions mainly in instances where the individual defines his/herself apart from the existing social categories.

Subsequently, an initial framework is proposed to profile online self-representation for cyber forensics based on avatar, gender, age identity, and ageism as shown in Figure 1.

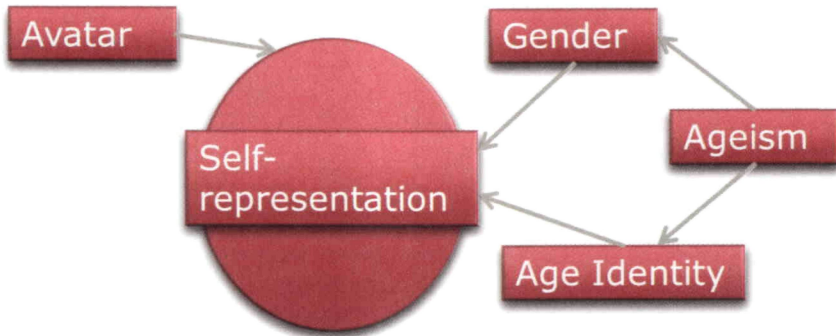


Figure 1: Profile of Online Self-Representation for Cyber Forensics

Both Gender and Age Identity are influenced by Ageism. An individual may explicitly state his gender or otherwise gendered in his avatar.

DISCUSSION AND FUTURE WORK

Cyberspace enables the extension of different social categories from the physical social systems. The avatar creation is gendered according to offline gender identity and social contexts. Both gender and age identity that is portrayed exhibit the influence of ageism. Reasons for anonymity may provide cues for forensic works. As such future work may include analysis of online conversations and online interviews for further insights on self-representation for forensic purposes. The framework requires further research for fundamental structuring of a forensic information system.

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